

REACTIVE GATE ELECTRODE CONDUCTIVE BARRIER

ABSTRACT OF THE INVENTION

5 A method, and corresponding transistor structure are provided for protecting the gate electrode from an underlying gate insulator. The method comprises: forming a gate insulator overlying a channel region; forming a first metal barrier overlying the gate insulator, having a thickness of less than 5 nanometers (nm); forming a second
10 metal gate electrode overlying the first metal barrier, having a thickness of greater than 10 nm; and, establishing a gate electrode work function exclusively responsive to the second metal. The second metal gate electrode can be one of the following materials: elementary metals such as p+ poly, n+ poly, Ta, W, Re, RuO₂, Pt, Ti, Hf, Zr, Cu, V, Ir, Ni, Mn, Co,
15 NbO, Pd, Mo, TaSiN, and Nb, and binary metals such as WN, TaN, and TiN. The first metal barrier can be a binary metal, such as TaN, TiN, or WN.